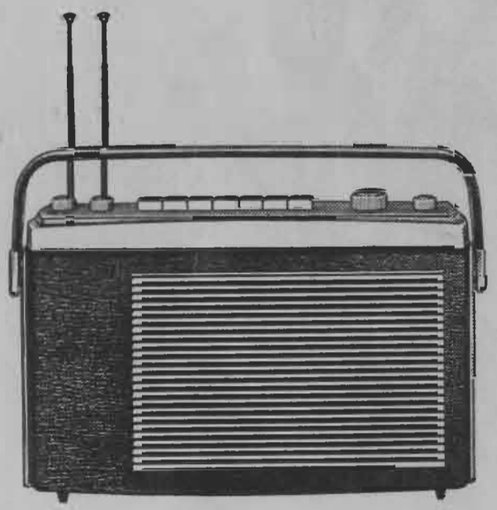
Ryland Huntley
16 OLD BOND STREET, BATH. Tel. 4332
RADIO & TELEVISION

beolit de luxe 611
k and t

SERVICE MANUAL



PRINTED IN DENMARK
EKSPRES-TRYKKERIET, STRUER

½ BANG & OLUFSEN PRODUKTIONSSELSKAB
STRUER - DENMARK Telephone (078) 51122* - Telex 4289 - Cable Address Bangalu!

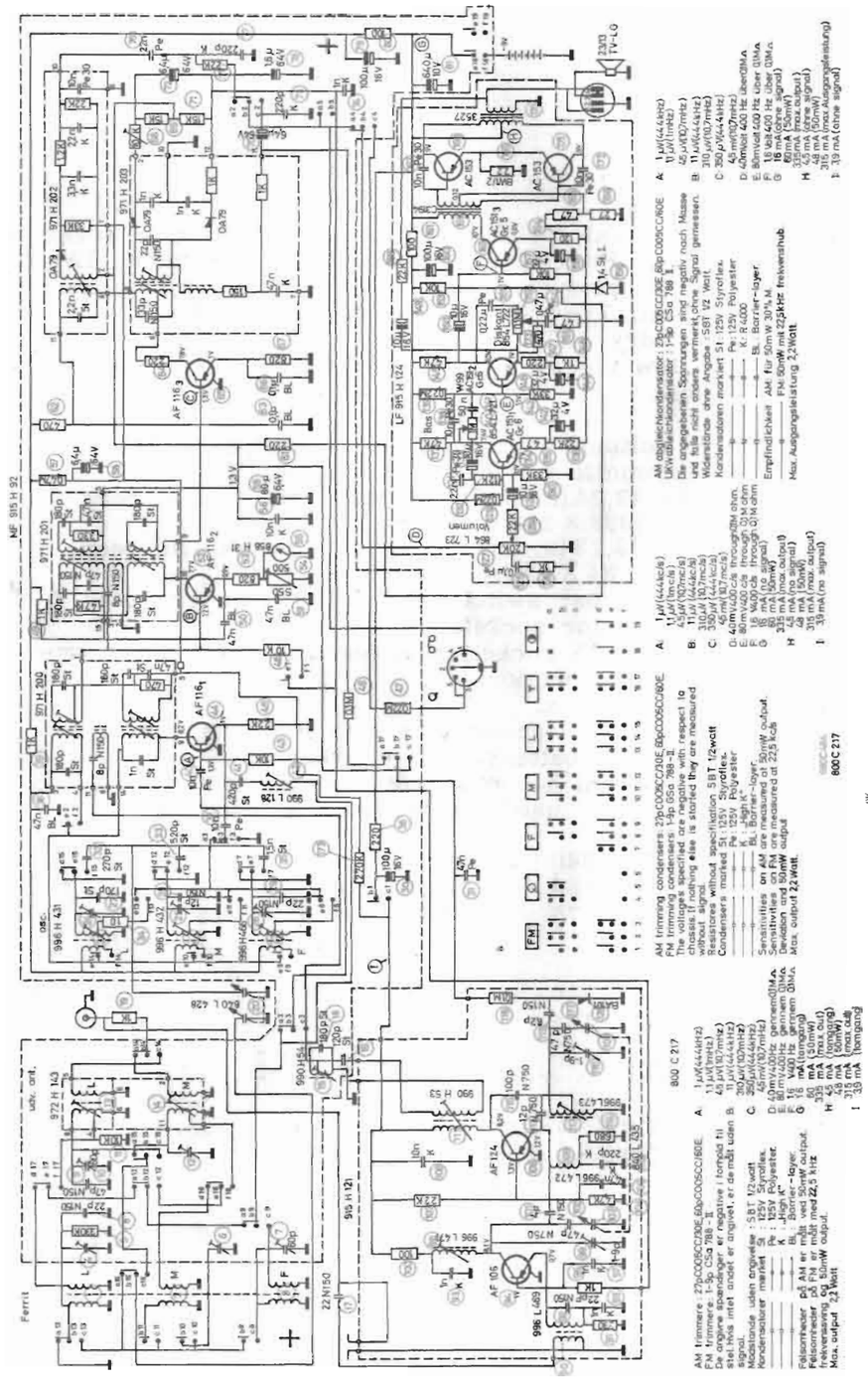
TECHNICAL DATA

Aerial, AM: Ferrite aerial for LW, MW, and FW. Connector socket for auto aerial. Push-button cuts out ferrite aerial on LW, MW.
Aerial, FM: Two telescoping whips, connector socket for auto aerial.
Auto Mounting Bracket: Type 920 H 5, for Model K only.
Battery: Six 1,5-volt dry cells.
Battery Drain: AM, low volume, approx. 16 mA., 50 mW output, approx. 60 mA.
Compensation for
Decreasing Battery Voltage: Voltage-stabilized output stage.
Control Circuits: Automatic frequency control on FM.
Dimensions, Model K: 12,94 in. wide, 9,19 in. high, 3,69 in. deep. (328 × 233 × 94 mm)
Model T: 13,13 in. wide, 9,38 in. high, 3,88 in. deep. (334 × 238 × 98 mm)
External Speaker: 3,5 ohms; switch-over feature incorporated in DIN connector socket.
Gramophone: 5-contact DIN socket, 20 K ohms (also used for tape recorder connection).
Power Output: 1,4 watts max.
Radiation, FM: Attenuated in accordance with FTZ standards.
Radicator: AM/FM tuning, battery-voltage indicator.
Tape Recorder Connection: 5-contact DIN socket, 20 K ohms (also used for gramophone connection).
Wave Bands:

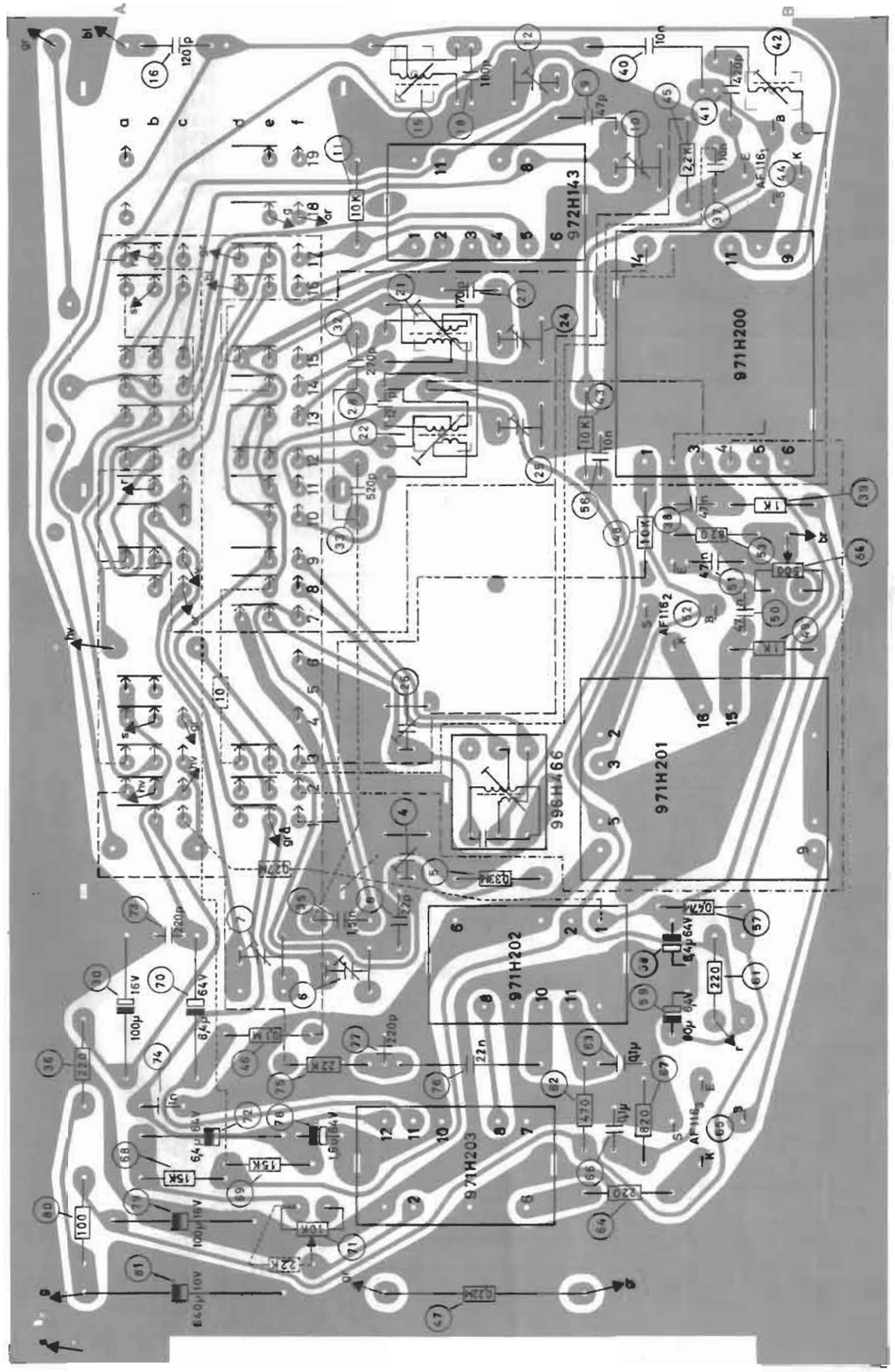
Model K:	LW	940	-	2040 m,	320	-	147 kc/s
	MW	184	-	572 -	1603	-	525 -
	FW	75	-	194 -	4000	-	1550 -
	FM				87	-	108 Mc/s
Export Model	LW	940	-	2040 m,	320	-	147 kc/s
	MW	184	-	578 -	1603	-	520 -
	SW	19	-	43 -	16	-	7 Mc/s
	FM				87	-	108 -

Weight, Model K: 7,8 lbs (3,55 kg) inclusive of dry cells.
- - T: 9,5 lbs (4,3 kg) - - - -

CIRCUIT OF BEOLIT DE LUXE 611 (DANISH)



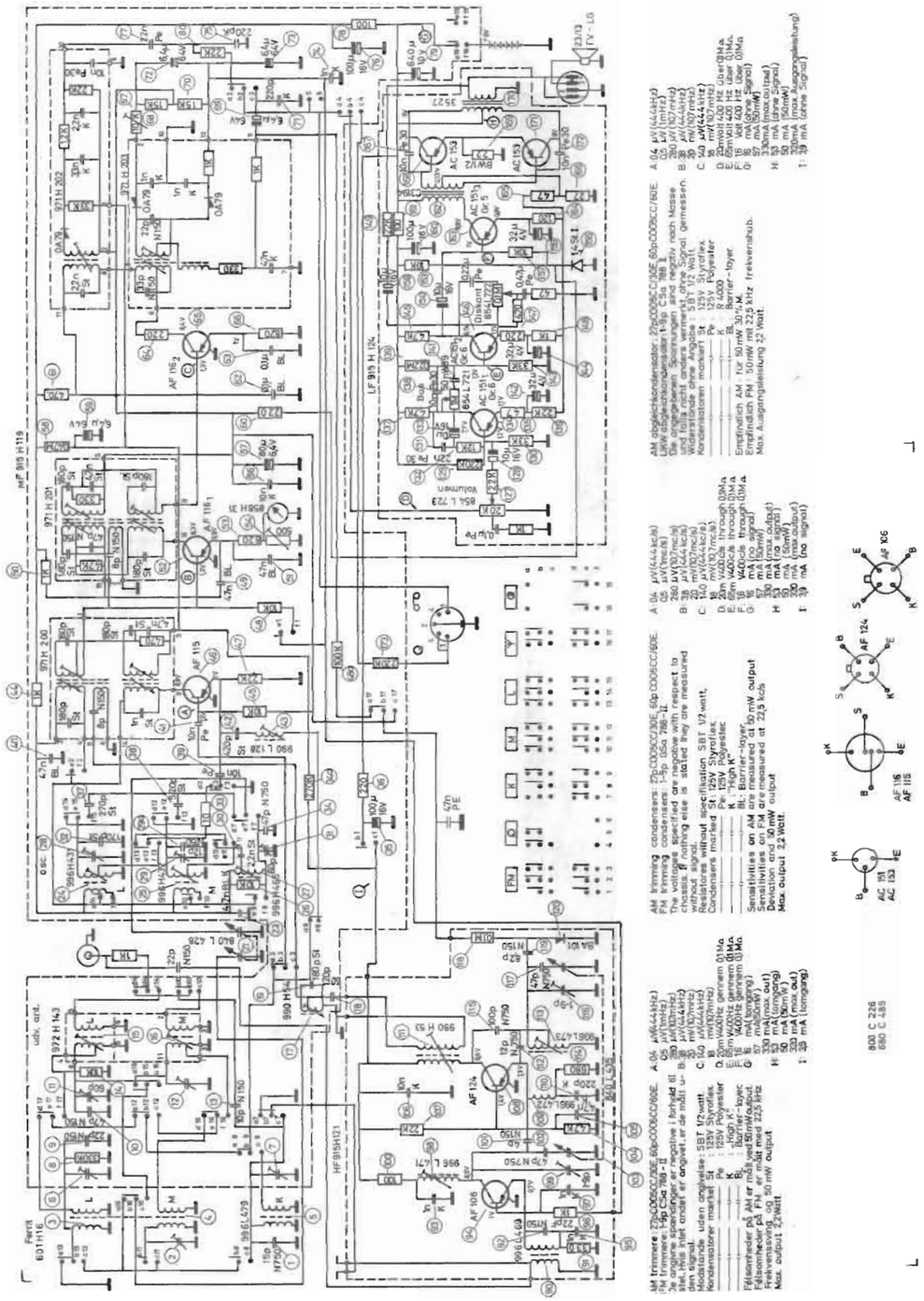
PW BOARD 602 L 3 A



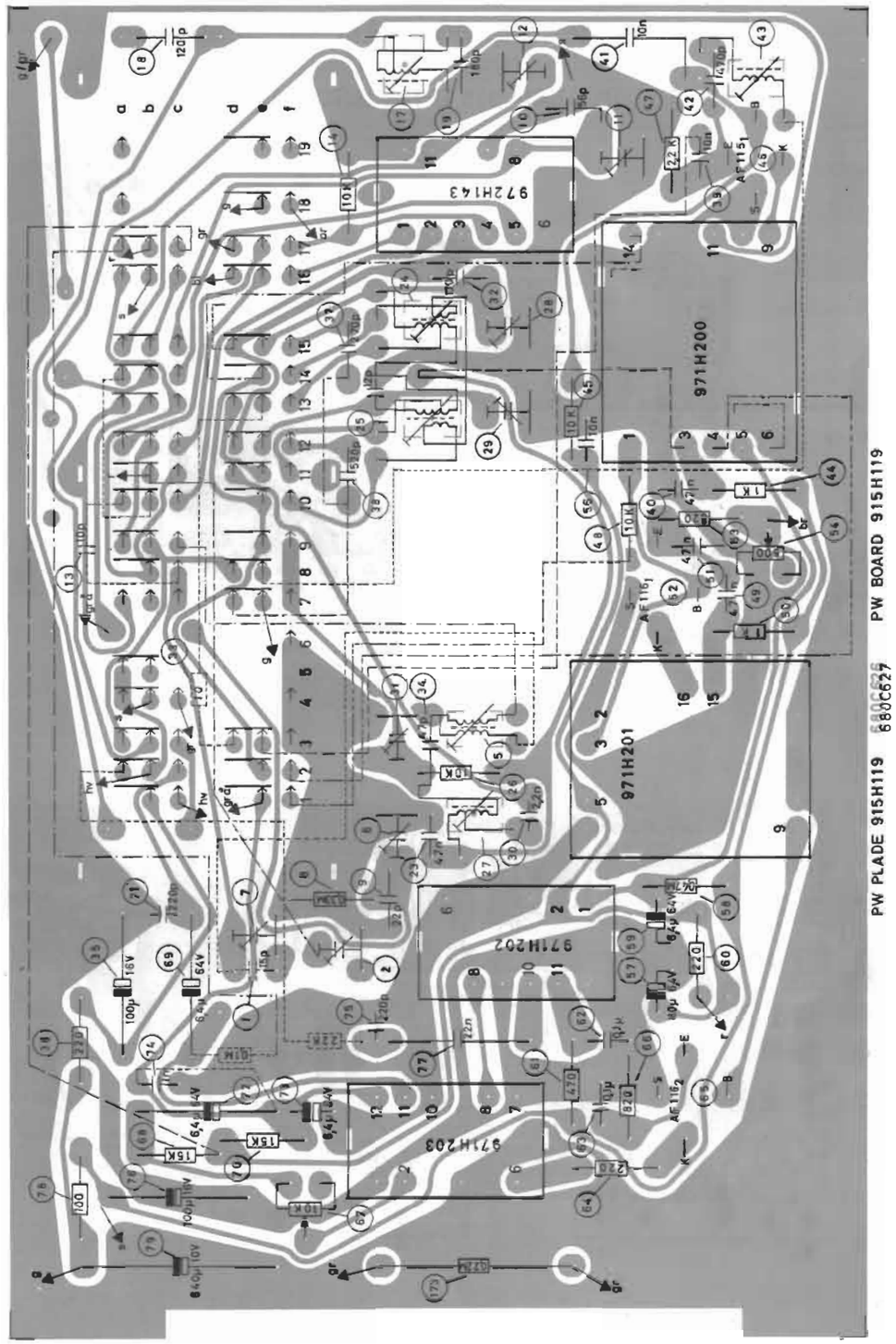
PW BOARD 602L3A
680C624
680C625

PW PLADE 602L3A

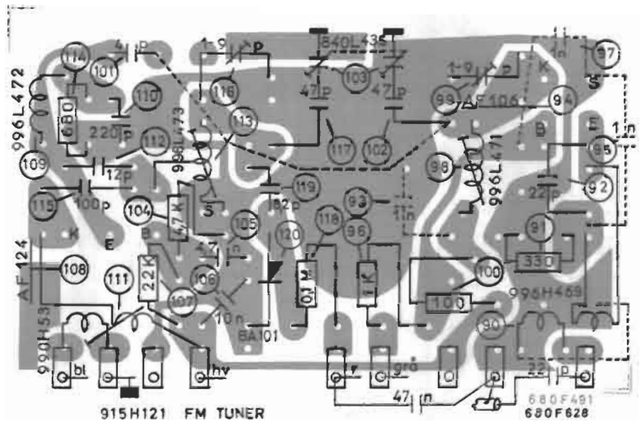
CIRCUIT OF BEOLIT DE LUXE 611 (EXPORT)

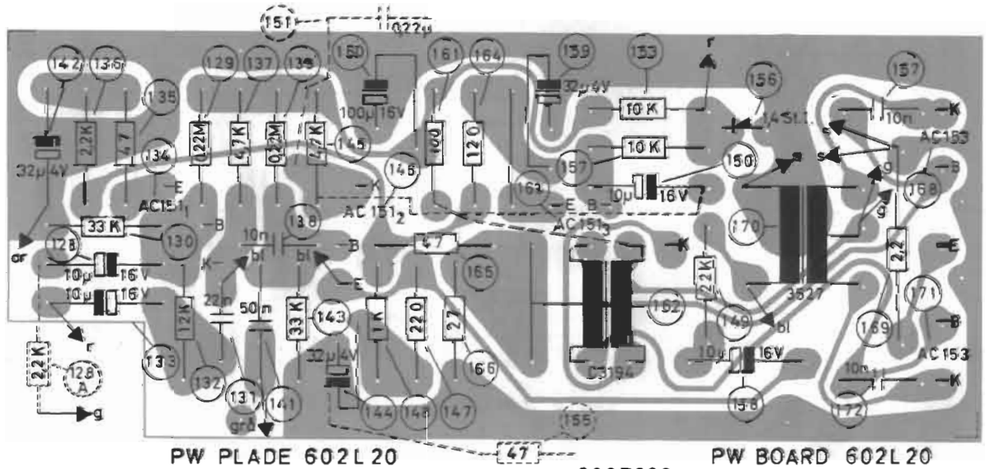


PW BOARD 915 H 119

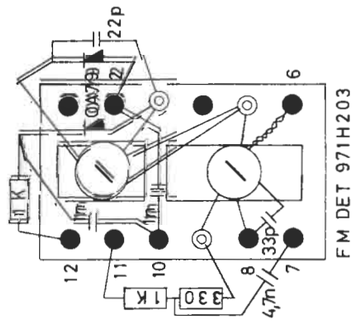


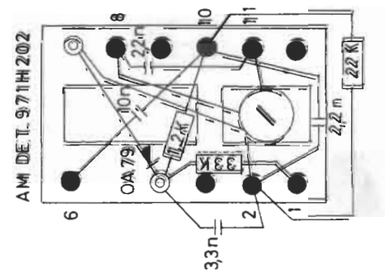
PW BOARDS 915 H 121 AND 602 L 20



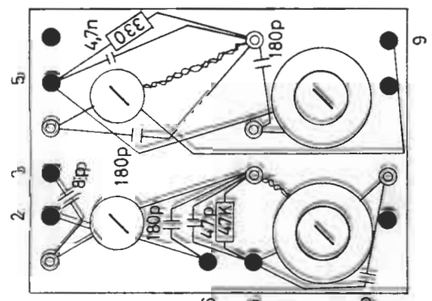


WIRING DIAGRAM FOR IF TRANSFORMERS

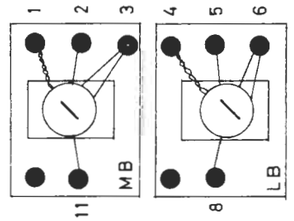




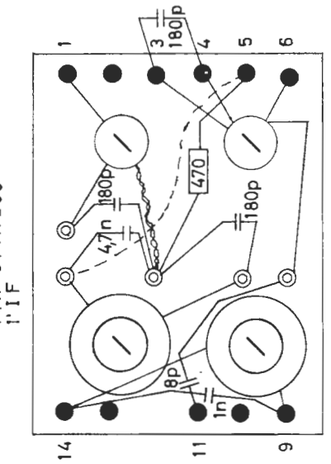
2' MF 971H201
2' IF
680F631

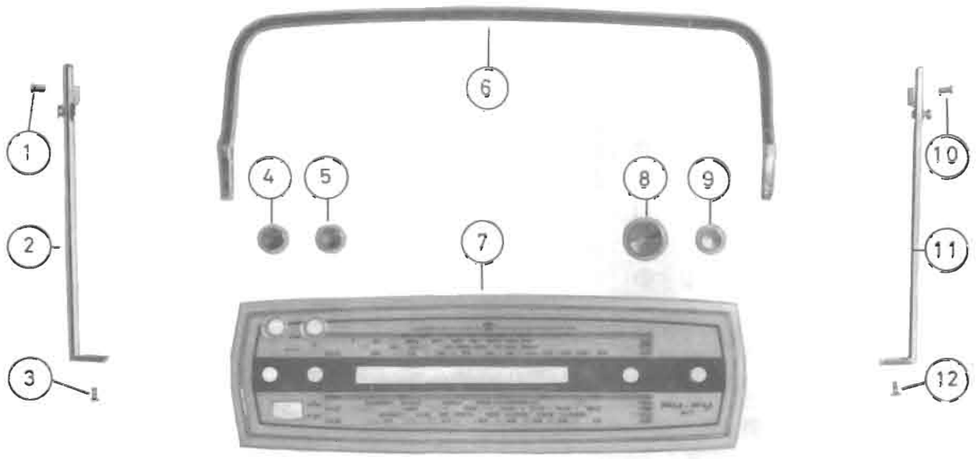


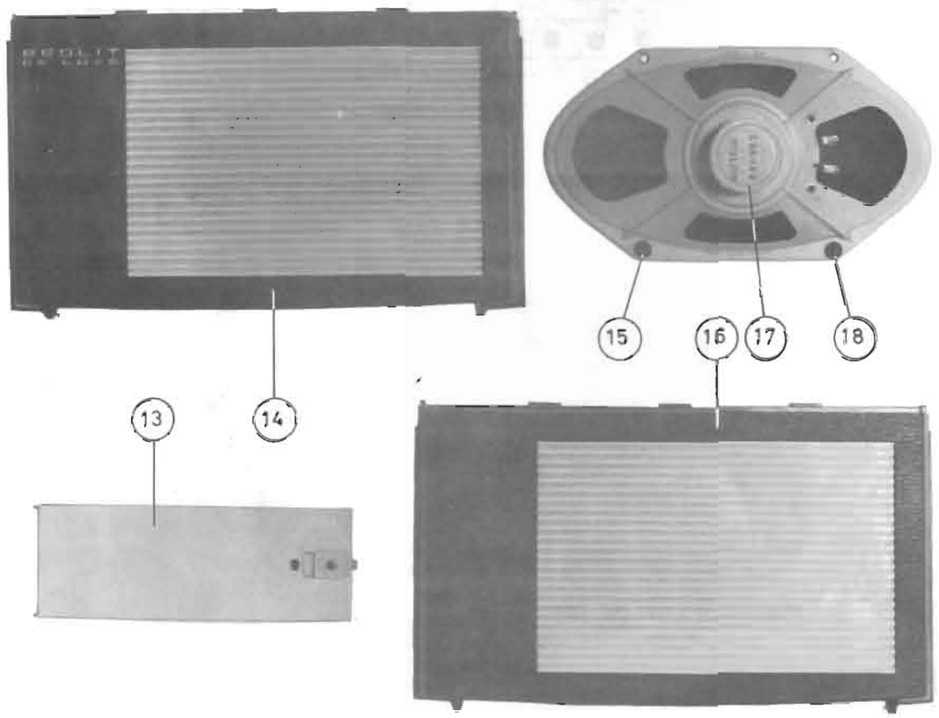
ANT. SPOLER 972H143
AER. COILS



1' MF 971H200
1' IF







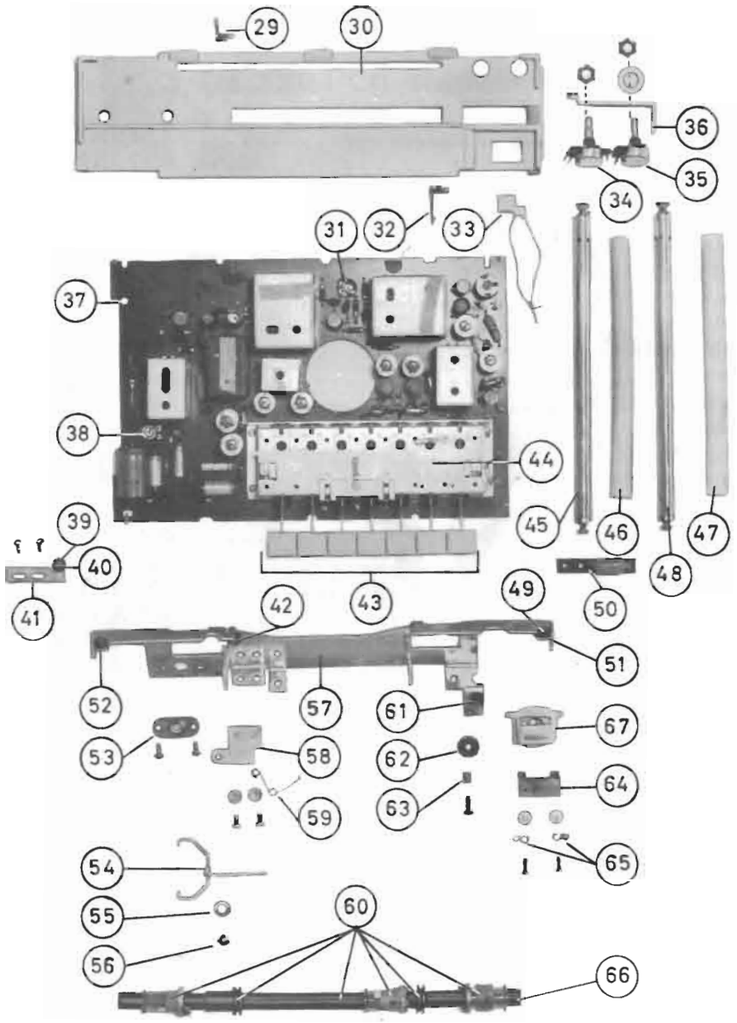
PARTS LIST, BEOLIT DE LUXE 611 K

*1	Screw	AM 3×8 FH nickel-plated
*2	Ornamental strip	690 H 85
3	Screw	AM 3×8 FH nickel-plated
*4	Knob, volume	928 L 112
5	Knob, bass	928 L 112
*6	Carrying handle	760 H 426
*7	Top, complete with dial etc.	690 H 82
*8	Knob, tuning	928 L 113
*9	Knob, treble	928 L 139
10	Screw	AM 3×8 FH nickel-plated
11	Ornamental strip	690 H 85
12	Screw	AM 3×8 FH nickel-plated
*13	Cover for battery box	690 H 83
*14	Cabinet, front section, red	690 H 73
	- - - green	690 H 74
	- - - black	690 H 75
	- - - blue	690 H 76
	- - - grey	690 H 77
15	Washer	4,4 ø × 10 ø × 1
*16	Cabinet, rear section, red	690 H 89
	- - - green	690 H 90
	- - - black	690 H 91
	- - - blue	690 H 92
	- - - grey	690 H 93
*17	Speaker	23/13 TV - LG
18	Washer	4,4 ø × 10 ø × 1

See photo on page 10

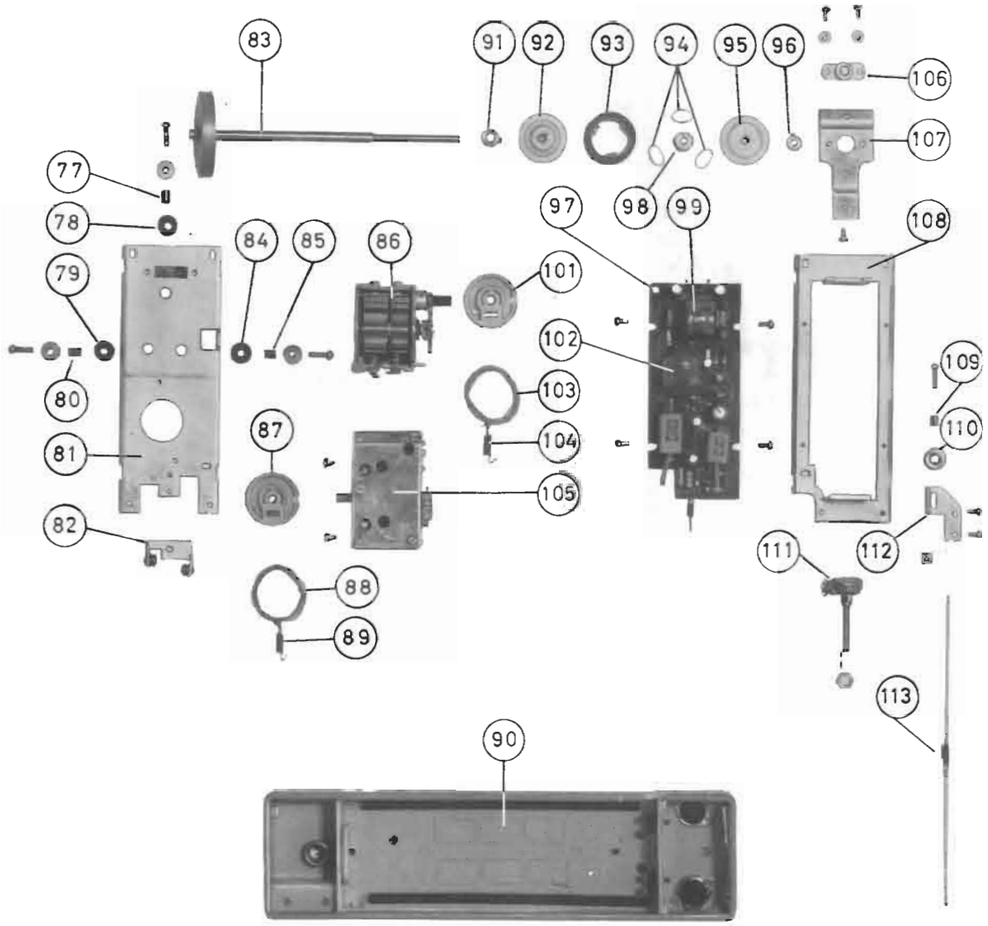
*29	Dial pointer, FM	760 L 480
30	Dial rear plate	534 C 48
31	Potentiometer	500Ω S 50
*32	Dial pointer, AM	760 L 481
*33	Volume indicator	760 L 479
*34	Potentiometer, bass	854 L 721
*35	Potentiometer, volume	854 L 723
36	Bracket	248 L 800

The parts marked with a * are prefered spare parts.



37	PW unit, complete, IF	915 H 92
	Coil, coupling	990 H 54
	- LW osc	996 H 431
	- MW -	996 H 432
	- SW -	996 H 466
	- 444 kc/s series trap	990 L 128
	Diodes	One BA 101
	-	Two OA 79's
	IF transformer, 1 st IF	971 H 200
	- - 2 nd IF	971 H 201
	- - AM det	971 H 202
	- - FM det	971 H 203
	Socket for electrolytic capacitor	506 H 101
	Transformer for ext. signal-freq. coils	972 H 143
	Transistors, AM mixer	AF 116
	- 1 st IF	AF 116
	- 2 nd IF	AF 116
	Trimmers, 30 pF	C 005 CC/30 E
	- 60 pF	C 005 CC/60 E
38	Potentiometer	10 KΩ 1-8680
*39	Pulley	10118 - 01
*40	Pivot for pulley	466 L 73
	Nut for pivot	2 MT
41	Bracket	249 L 230
42	Pulley	10118 - 01
*43	Buttons for push-button switch	690 H 96
44	Push-button switch assembly	854 F 706
*45	Telescoping whip	IE 2044/3
46	Insulating tubing	11 ø, 15 cm PVC
47	Insulating tubing	11 ø, 15 cm PVC
48	Telescoping whip	IE 2044/3
49	Pivot for pulley	466 L 73
	Nut for pulley	2 MT
50	Terminal strip	280 L 381
51	Pulley	10118 - 01
52	Pulley	10118 - 01
53	Bearing	400 L 33
54	Lever	387 H 310
55	Spring washer	286 L 200
56	Screw	106 L 91
57	Bracket	504 C 265
58	Clamp	288 L 36
59	Spring	335 L 160
60	Ferrite aerial, complete with coils	601 H 13
61	Pulley	10118 - 01
62	Pulley	10163 - 06
63	Bushing for pulley	410 L 165
64	Bracket	249 L 228
65	Soldering tags	4052
*66	Ferrite rod, without coils	760 L 477
*67	Radicator	858 H 45

The parts marked with a * are prefered spare parts.

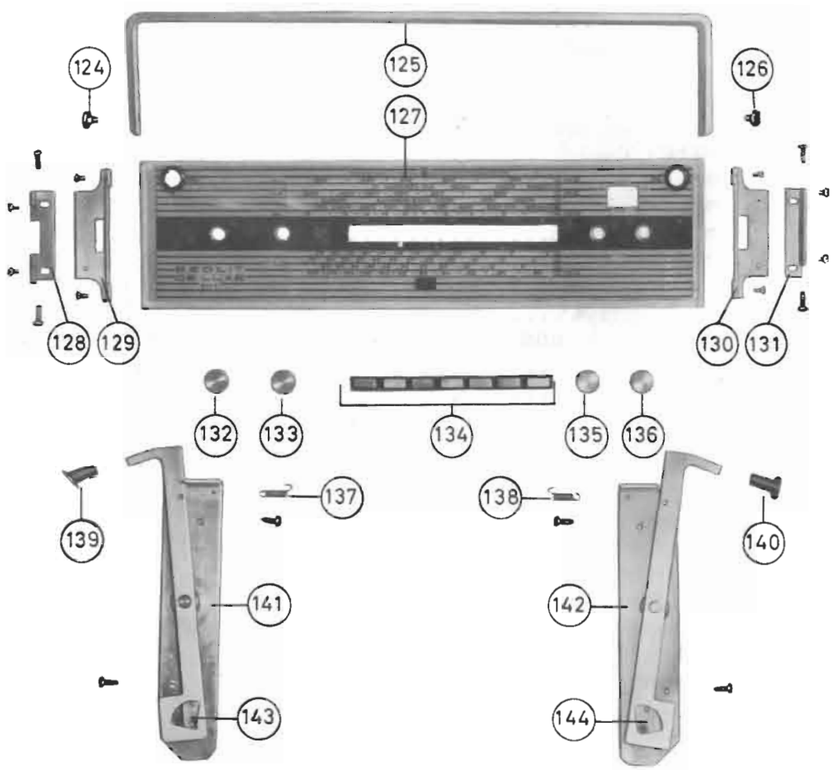


Extra Accessories

Plug,	Aerial	10076
-	Gramophone	8-7506
-	Speaker	S.34
-	Tape Recorder	8-7506

77	Bushing	410 L 273
78	Bushing	411 L 36
79	Bushing	411 L 36
80	Bushing	410 L 273
81	Chassis	504 F 267
82	Bracket	248 L 802
83	Drive shaft with flywheel	760 L 418
84	Bushing	411 L 36
85	Bushing	410 L 273
*86	Tuning capacitor	840 L 428
*87	Dial drive wheel	312 L 57
88	Dial cord	E 3
89	Spring	330 L 194
*90	Battery box, complete	690 H 84
91	Stop ring	376 L 380
92	Washer	377 H 76
*93	Coupling	760 L 491
*94	Springs	335 L 156
95	Washer	377 H 76
96	Stop ring	376 L 381
97	PW unit, AF and output section	915 H 124
	Clamp	240 L 274
	Diode	1,4 ST1
	Transistor, AF	AC 151
	- AF	AC 151
	- AF driver	AC 151
	- output	Two AC 153's
*98	Hub for coupling	760 L 483
99	Transformer, output	ST 3527
*101	Cord wheel	312 H 39
102	Transformer, driver	ST C 3194
103	Dial cord	E 3
104	Spring	330 L 194
105	FM tuner	915 H 121
106	Bearing	400 L 29
107	Bracket	248 H 821
108	Chassis	504 F266
109	Bushing	410 L 165
110	Pulley	10163 - 06
*111	Potentiometer, treble	854 L 722
112	Bracket	245 L 460
113	Spring	330 L 194

In receivers of the No.2 series, two other types of pulleys are used: 10387 - 04
10143 - 05



PARTS FOR BEOLIT DE LUXE 611 T EXP.

*32	Dial pointer, AM	760 H 489
124	Screws	104 L 85
*125	Carrying handle	326 F 79
*126	Screws	104 L 85
*127	Top, complete	690 H 94
128	Bracket	245 H 556
129	Bracket	245 H 535
130	Bracket	245 H 535
131	Bracket	245 H 555
*132	Knob, treble	322 L 160
*133	Knob, tuning (small)	322 L 160
	Knob, tuning (large)	322 L 175
*134	Buttons for push-button switch	690 H 97
135	Knob, bass	322 L 160
136	Knob, volume	322 L 160
137	Spring	330 L 194
138	Spring	330 L 194
*139	Slide shoe	585 H 26
140	Slide shoe	585 H 26
141	Bracket	760 H 444
142	Bracket	760 L 443
143	Lever	760 L 442
144	Lever	760 L 442
	Ferrite aerial, complete with coils	601 H 16
	- - without coils	10 × 180
	Cabinet, wood	532 B 616
	Push-button switch assembly	854 F 765
	PW unit, IF	915 H 119
	Coil, SW osc	996 L 465
	- SW signal-frequency	996 L 479

other parts as specified for BEOLIT DE LUXE 611 K

PARTS FOR BEOLIT DE LUXE 611 K EXP.

Ferrite aerial, complete with coils	601 H 16
- - without coils	10 × 180
Push-button switch assembly	854 F 739
PW unit, IF	915 H 119
Coil, SW osc	996 L 465
Coil, SW signal-frequency	996 L 479
Top, complete	690 H 87

other parts as specified for BEOLIT DE LUXE 611 K.

The parts marked with a * are prefered spare parts.

DESCRIPTION

The BEOLIT DE LUXE 611 is an FM-AM transistor receiver for battery operation only. It consists of the following units:
PW unit 915 H 121, screened FM tuner with AFC diode.
PW unit 915 H 92, AM coil assembly and IF section (Model K).
PW unit 915 H 119, AM coil assembly and IF section (Export Models).
PW unit 915 H 124, AF and output section.

FM

The FM tuner uses one AF 106 and one AF 124 transistor. A Type BA 101 AFC-diode receives control voltage from the discriminator; the AFC circuit can be deactivated by applying a stabilized voltage to the diode instead of the discriminator voltage.

AM

AF 116_1 operates as a self-excited mixer and normally is connected to the ferrite aerial. The aerial push-button cuts in screened LW and MW coils instead, for use with an auto aerial. AF 116_2 and AF 116_3 are IF amplifiers.

AF

AC 151_1 and AC 151_2 are conventional AF amplifiers. The AC 151_3 driver receives stabilized base bias via diode 1,4St.1. This stabilized bias is passed through the emitter circuit to the AC 153 output transistors. This arrangement keeps the current consumption virtually constant at decreasing battery voltage, thus minimizing distortion on loud passages.

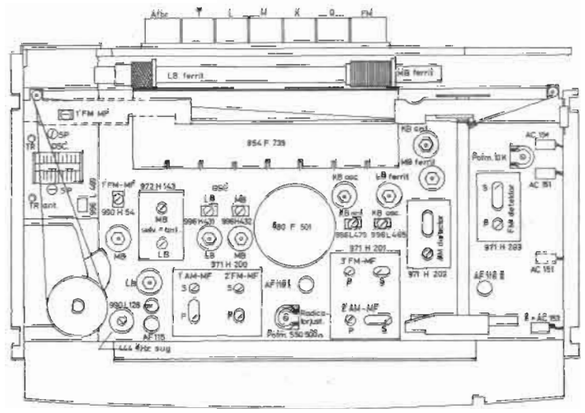
TAPE RECORDER AND GRAMOPHONE

are connected to a common DIN connector socket. Pin 1 is used for recording. Pin 3 may be used for playback. A Model G 42 VF record player or a record player with a crystal pick-up may be used.

MODIFICATIONS AND SERVICE TIPS, MODEL K

Since production was commended, the efficiency of the FM whips has been improved by altering the coupling between the whips and the tuner. The 22 pF capacitor (No. 17) has been transferred from the solder tag of the left whip to the first solder tag of the FM tuner in series with the inner conductor of the coaxial cable, and the cable screening is connected to the next tag. The aerial connector socket is connected directly to the left whip.
Instability on FM may be due to a too-high standing-wave ratio caused by coupling between the right whip and a PW chassis conductor at the edge of PW unit 915 H 92. The chassis conductor should be opened between points A and B as shown on page 4.
Crossover distortion may be minimized by raising the no-signal current drain to 25 mA ± 20% as measured at point G, by altering the value of the resistor numbered 166 in the circuit diagram from 27Ω to 39Ω.

AM Alignment and Sensivities.



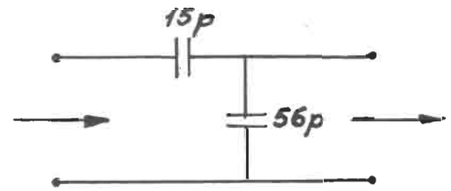
Alignment of the 444 kc/s AM IF channel is carried out with the receiver tuned to the middle of the MW band. Apply the sweep generator signal to AF 116_1, point A, through a 0,1 µF capacitor. Connect the oscilloscope to the potentiometer at point D. Screw the tuning core of the 444 kc/s series trap all the way out and adjust the five IF cores for maximum responce and symmetrical curve form, bandwidth 5 kc/s at 6 dB. Tune series trap for minimum responce.

Alignment Points.

Pointer adjustment mark at left side of dial. The ferrite aerial should be aligned in this sequence: LW, MW, FW. Sensitivities measured in a screened room with a dummy aerial:

LB :	160 kc/s		160 µV/m	at	50 mW,		272 kc/s		315 µV/m	at	500 mW
MW :	584	-	80	-	- 50	-	1484	-	50	-	- 50 -
FW :	1594	-	32	-	- 50	-	3750	-	50	-	- 50 -

Alignment for external aerial should be performed through a dummy aerial.



LW :	160 kc/s		50 µV	at	50 mW,		272 kc/s		63 µV	at	500 mW.
MW :	584	-	45	-	- 50	-	1484	-	100	-	- 100 -
Model Export:											
SW :	8,5 Mc/s		63	-	- 50	-	15,3	-	2,24	-	- 50 -

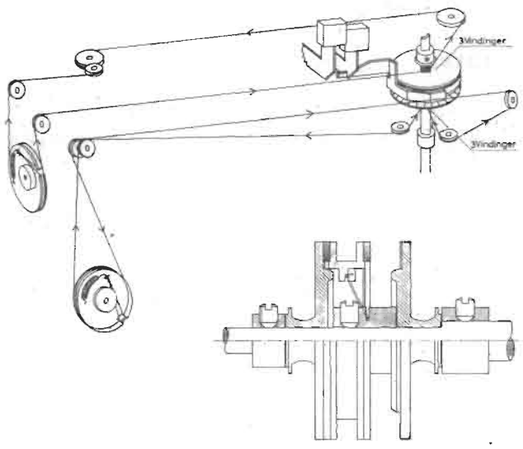
The radicator should be adjusted with new dry cells inserted and MW and FW push-buttons depressed. Turn 500-ohm potentiometer until needle hits stop, then back off until needle just clears stop.

FM Alignment and Sensitivity.

Apply a 97 Mc/s sweep signal through the aerial connector socket and connect the diode probe from the oscilloscope to the collector of AF 116$_3$. Adjust the five IF cores for maximum responce and symmetrical curve form at a bandwidth of 250 kc/s ± 30 kc/s at 6 dB; marker point 10,7 Mc/s. Take off the discriminator curve across the 220 pF capacitor numbered 73 in the circuit diagram without using a diode probe and adjust the last core for symmetrical wave form. Adjust the 10 KΩ resistor numbered 68 for maximum noise suppression. Adjust the cores of the FM tuner osc. and signal-frequency coils at 89 Mc/s and the osc. and signal-frequency trimmers at 106 Mc/s.

Sensitivity: 92 Mc/s 2,8 µV EMF at 200 mW.
Signal-noise ratio: 12 dB 1,6 µV EMF, 400 c/s at max. bass and treble.

DIAL DRIVE



In receivers of the No. 2 series, the dial drive has been modified, several of the pulleys having been relocated and replaced by others of larger diameter. Also, chassis part No. 57 (see page 10) and other small parts have been modified, for which reason this modification is not directly applicable to receivers of the No. 1 series.

No. 1 series: Numbers 719701 - 726000
No. 2 series: The rest of the numbers.

NOTE

The dial drive of this model has shown a tendency to fail as it is possible for the three springs designated 335 L 156 to dislodge themselves from the duplex coupling. A modification has now been introduced: the three lobes on the hexagonal hub engage with matching cutouts in the coupling (Fig. 1) so that the only task to be performed by the springs consists in pressing the coupling up or down to the FM or AM dial cords, respectively.

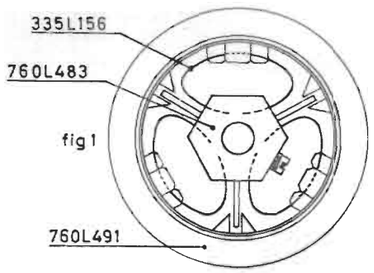


fig 1

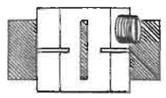


fig 3

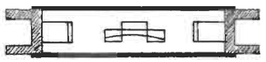


fig 2

The dial glass and the dial plate should be disassembled and the screw in the duplex lever removed so that the lever can be tipped to one side. The hub should be mounted in such a manner that the pointed screw faces upwards towards the dial (Fig. 3), and the coupling should be placed as shown in Fig. 2. The bends of the three springs should be placed in the cutouts of the coupling ring in such a manner that the bend faces downwards.

Components may be ordered under these code designations:

Coupling.....	760 L 483
Hub.....	760 L 491
The three springs are unaltered	335 L 156